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regions should be employed to thoroughly explore their surroundings; specialists should be sent during the summer to study certain problems. In short, a few thousand dollars from an overflowing treasury could be made to yield an ample return in our better knowledge of one of the noblest and (in a public way) most neglected sciences.

OPEN LETTERS.

A Query.

Can any of the readers of the GAZETTE say whether the spores of *Marsilia* grown in the United States germinate readily? Having made several unsuccessful attempts last winter to grow the spores, I was informed by Professor Pfeffer that it is difficult to germinate spores grown in Germany, and that all accounts hitherto published have been made from spores imported from Australia. It would be interesting to know whether the same difficulty is met in the United States, and if so, what is the cause.

D. H. CAMPBELL.

Tübingen, July, 1887.

NOTES AND NEWS.

IN THE *Journal of Botany* for June Mr. Arthur Bennett presents a revision of the Australian species of *Potamogeton*, describing one new species.

THE SECOND EDITION of Strasburger's *Botanisches Practicum* has appeared in Germany.

Dr. W. ZOPF has been made Professor-extraordinary of Botany in the University of Halle.

Dr. G. BERTHOLD has been called to the professorship of Botany in the University of Göttingen.

SCARCELY more than a year has passed since the appearance of de Bary's *Vorlesungen über Bacterien*, yet a second and revised edition has been issued by Engelmann.

MR. ROBERT HESSLER, of Connersville, Ind., finds *Gaura coccinea* growing along the C. H. & I. R. R. near that place. His plant was very bushy and about fifteen inches high.

THE *West American Scientist* for June has an interesting article on the "Oaks of Southern and Lower California" by the editor. It is accompanied by a photograph of live-oaks.

Dr. BYRON D. HALSTED, in *Agricultural Science*, has published a paper on the germination of cucurbitaceous plants.

PROF. L. H. BAILEY, JR., of Michigan Agricultural College, wants specimens from all parts of the country of *Carex grisea* (especially from the south and west), *C. triceps*, *C. arctata*, and *C. retrocurva*.

THE COLONIAL government of Cochin China has conferred upon Dr. Pierre a life pension of 6,000 francs, to provide for the uninterrupted completion of his *Forst-Flora* of Cochin China.—*Nat. Nov.*

DR. EDWARD R. VON JANCZEWSKY has been made Professor of Anatomy and Physiology of Plants in the University of Krakow.

DR. J. C. ARTHUR has accepted the professorship of Botany in Purdue University, pending the establishment of an experiment station at the university. After Sept. 1 his address will be Lafayette, Indiana.

DR. A. DE BARY, of the Botanical Institute at Strasburg, has been appointed Professor of Botany and Director of the Botanical Institute of the University of Leipzig, to succeed Prof. A. Schenk, who retires.

THE BULLETIN of the Calif. Acad. Sci., vol. ii., No. 6, has just been issued. Of botanical interest it contains E. L. Greene's "Studies in the Botany of California and Parts Adjacent—V.," already noticed on p. 346, vol. xi.

DR. N. S. TOWNSHEND delivered an address before the Columbus Horticultural Society at their meeting on May 28, on "Botany in the olden time." The address is printed in the *Journal* of the society for May.

IN THE proceedings of the Newport Nat. Hist. Society, a lecture by Prof. W. W. Bailey on the "Flora of Rhode Island" is published. It is full of interest, and at the close makes a telling appeal for herbaria and botanic gardens.

IN THE *American Naturalist* for June R. C. Stearns describes and figures *Araujia albens* (a South American asclepiad) as a moth trap. The moth is caught by its proboscis in searching for nectar, and the more it pulls the tighter the grip, something on the principle of an old-fashioned boot-jack.

REV. FRANCIS WOLLES new work on the "Fresh-water Algæ of the United States," which has just been issued, consists of two volumes, one of plates and one of text. It is published by the author, and sold for ten dollars, which is less than half the price of Cooke's "British Fresh water Algæ," a similar but smaller book.

IN HIS SYNOPSIS of Tillandsiæ Mr. J. G. Baker has completed the first five genera, *Sodirola*, numbering 3 species (1 new), *Caraguata* 12 species, *Schlumbergeria* 3 species, *Guzmania* 5 species (1 new), and *Catopsis* 9 species (4 new). *Tillandsia* contains 11 sections, and 19 of its species are described in the July *Journal of Botany*.

DR. GEORGE VASEY, botanist to the Department of Agriculture, has published his third bulletin. The subject is, "Grasses of the South," a pamphlet of 63 pages and 16 plates. Dr. Vasey is doing a valuable work in getting at the needs of various regions and disseminating knowledge concerning the cultivation of grasses and forage plants.

W. D. HAYS' books on fungi seem to be arousing not only the indignation but merriment of our English brethren. The following passage from a review in *Gardener's Chronicle* is a sample: "As for the edible species, perhaps the less said of them the better; possibly some of our very remote, flat-headed, palæolithic precursors might have been able (if their jaws were powerful enough) to masticate woody and leathery Polyporei, accompanied by sheets of dry rot peeled from prostrate logs, with a dessert of shivering, cold and loathsome Tremellas."

THE SIXTH EDITION of Dietrich's *Forst-Flora*, "a description of the most important trees and shrubs for the forester," has just been completed by the publication of the sixtieth *lieferung*. It forms two large quarto volumes, with 300 colored plates. Dr. von Thümen, the editor, is to be congratulated upon the completion of so valuable a work for forestry interests.

THE DISCOVERY, at Kew, of a sensitive labellum in *Masdevallia*, an Australian orchid, adds to the attractions of that already richly dowered group of plants. An insect alighting on the labellum is lifted up at first slowly, then suddenly as if with a click is caught in the box formed when the lip is closed. In about twenty minutes the lip descends and is as irritable as before.

TEACHERS who wish to demonstrate the presence of starch in vessels will find that it occurs abundantly in the vessels of the leaf-stalks of *Plantago major*, and also in several other species. Fischer finds the quantity to vary from a few grains to sufficient to completely fill the vessel. Schrenk finds starch abundant in the pitted vessels of the root stock of *Aristolochia Serpentaria*.

SCIENCE has changed its form and price, the former for the sake of the latter, which could be its only excuse. Having become attached to the old dress, we are not yet prepared to say that we like the new. Time may prove that this was a wise step, and publishers understand their needs better than any one else can, but to an outsider the change looks like a step downward from a high plane.

DIE NATURLICHEN PFLANZENFAMILIEN appears with most commendable rapidity, and the work continues of the same high grade, both in the matter of text and illustration. The eighth part, just at hand, continues the discussion of the Gymnospermæ, begun in the third and fourth parts. The Coniferæ are by Eichler, Engler and Prantl; Gnetaceæ by Eichler; Angiospermæ are also begun by Engler.

MR. WATSON writes that *Arabis petraea* is to be dropped from our N. Am. flora. The Willoughby Mt. plant of the Manual is a true *Sisymbrium*, *S. humile* of Meyer, an Asiatic species found throughout British America from Anticosti to British Columbia and Alaska. The Vermont locality is the only one known in the United States. On the other hand, the Greenland *Sisymbrium humifusum* is an *Arabis*, and is found in Labrador and on the west coast of Hudson's Bay.

THE ADDRESS of Axel Blytt, on "Distribution of Plants," before the botanical section of the Association of Scandinavian Naturalists, is published in the July *Journal of Botany*. His opening sentence is, "The distribution of plants is essentially dependent on climate." His last words are, "I believe the precession of the equinoxes to be a natural cause of such changes in climate, and that the distribution of species is essentially governed by the periodical changes in the earth's orbit."

THE COLUMBUS (O.) HORTICULTURAL SOCIETY held a "strawberry meeting" early in June at Horticultural Hall of Ohio State University, at which papers were read treating of the strawberry from a botanist's stand-point, Prof. W. R. Lazenby; from an originator's stand-point, M. Crawford; from an entomologist's stand-point, W. B. Alwood; from an editor's stand-point, J. J. Jauney; and from a chemist's stand-point, Prof. H. A. Weber. At the close of the meeting the members present considered the strawberries present from the epicure's stand-point, which was no doubt the most delightful stand-point of all.

THE REPORT of the department of botany, British Museum, for 1886, shows 48,111 specimens mounted during the year. The most important collection added was the herbarium of the mycologist C. E. Broome. It consists of a collection of British and foreign fungi, comprising about 40,000 specimens, many of them types. From Edinburgh has been received a collection of plants belonging to Archibald Menzies, who accompanied Vancouver round the world, and whose name is so familiar in our western botany. Our own collectors are well represented among the purchased specimens.

JOS. F. JAMES has a paper in the July number of the *American Naturalist* on "Milkweeds," throughout which he very curiously confounds the latex and the "sap" of these plants. On p. 608 he says: "Yet, not every plant possesses a sap of such service as that of the milkweed. Serving as a vehicle for the conveyance of nourishment from the roots to the leaves, it carries with it at the same time such disagreeable properties that it becomes a better protection to the plant. * * * There are a great many plants which possess a milky sap, only not so well developed as in the milkweed."

THE LAST NUMBER of *Drugs and Medicines of N. A.* (March) contains the conclusion of the account of *Lobelia syphilitica*, *L. cardinalis*, *Scrophularia nodosa*, *Lindera Benzoin*, *Diphylleia cymosa*, *Cercis Canadensis* and *Erechtithes hieracifolia*. The usual excellence characterizes both text and illustrations. An extensive foot-note gives a sketch of Dr. B. S. Barton, one of the early American botanists of note. It would seem that the claims of a plant which is neither a commercial drug nor used in medicine to a place in this work were somewhat tenuous. This is the case with three of the species listed above.

M. F. CRÉPIN has published (Roy. Bot. Soc. Belgique) "Nouvelles remarques sur les Roses Américaines," called out by Mr. Watson's "History and Revision of the Roses of North America." M. Crépin gives directions to collectors concerning collecting and observation, and then follows with critical remarks upon the species as presented by Mr. Watson. The object is to arouse additional investigation with regard to certain species. *RR. acicularis*, *Nutkana*, *minutifolia*, *Carolina*, *humilis*, *foliolosa*, *setigera* and *gymnocarpa* are considered well-known and defined species. *RR. lucida* and *nitida* need further observation. *R. Mexicana* is not pronounced upon, as M. Crépin has not sufficient material; while *RR. blanda*, *Arkansana*, *pisocarpa*, *Californica*, *Fendleri* and *Woodsii* are said to be questionable species.

R. W. RAYMOND's paper on "Indicative Plants," read before the St. Louis meeting of the Am. Inst. of Mining Engineers, has been distributed. Referring to the uses made of "signs" by practical miners, prospectors, etc., who neglect nothing, for everything is equally important to them, the author thinks that modern science has neglected them too much. *Viola calaminaria*, the Westphalian "zinc-violet," is described and figured; also, *Amorpha canescens*, the "lead-plant." Dr. F. Stapff, of Berlin, also reports, since the presentation of the paper, that at Carceres, Spain, the native prospectors locate with surprising skill, in spite of surface gravel, the underlying outcrops of phosphorite, by means of the growth of *Convolvulus althæoides*. The author adds a fourth case from Montana, where a plant, regarded by experienced prospectors as an indication of silver ore in the soil, turns out to be *Eriogonum ovalifolium*, which may be destined to be called the "silver-plant."

J. M. JANSE records¹ a remarkable instance of mimetism in the flowers of *Maxillaria Lehmanni*, from Central America. On the central region of the labellum is a callosity which is covered by a fine yellow powder, which bears an almost exact resemblance to a layer of detached pollen-grains. The author suggests that they are taken for pollen-grains by bees, which devour them eagerly for the large quantity of starch which they contain. * * * The substance in question appears to be an epidermal structure, consisting of the detached, nearly spheroidal, constituent cells of moniliform hairs. Herr Janse believes that this is the first instance recorded of the occurrence of starch in hairs.—*Jour. Roy. Mic. Soc.*

ONE OF THE most important recent announcements is that of the publication of the "Annals of Botany." It is to be an occasional appearance of original papers, well illustrated, on all subjects pertaining to botanical science. The form will resemble that of the *Quarterly Journal of Microscopical Science*, and the fact that it is to be published by the Oxford University Press is a guarantee of fine typographical work. The editors are Prof. Bayley Balfour (Oxford), Dr. Vines (Cambridge) and Dr. Farlow (Harvard). The most prominent botanists in Britain have promised their support, as well as Dr. Gray and Dr. Farlow in this country. It will appear in parts, and the price for each volume will be one guinea.

THE REPORT of the department of agriculture of the University of Minnesota, a single volume covering a period of several years and recently issued, contains two papers by J. C. Arthur on the supposed poisonous algæ, *Glœotrichia Pisum* (at first called *Rivularia fluitans*), being the result of observations made in 1882 and 1884. The first of these papers has been already noticed in this journal (vol. viii., p. 266). They deal with the appearance and geographical distribution of the alga, and especially with its supposed poisonous qualities when swallowed by cattle. Prof. M. Stalker, State Veterinarian of Iowa, also makes a report on the latter inquiry; and both observers conclude that the facts do not sustain the view that the alga is detrimental to the life or health of animals.

PROF. THOS. C. PORTER has issued "A List of the Carices of Pennsylvania," a reprint from Proc. Philad. Acad. The authority of the list, aside from the name of a well-known botanist, is attested in the first sentence: "All the species of *Carex* contained in this list are represented in the herbarium of Lafayette College by specimens from all the counties named, with the single exception of *C. Torreyi*." If all our catalogues rested upon such a substantial basis they would mean much more than they do. Prof. Porter has long had Pennsylvania botany within the reach of his hands, and in no group has he taken greater interest than in Carices. A good feature is putting the name of the county first in small caps, followed by particular stations in ordinary print, and then the name of the collector in italics. The list comprises 122 numbers, 98 species and 24 varieties.

WHETHER "for the present and for practical purposes a lichen remains a lichen" or not, the evidence seems to be daily growing stronger that a lichen is nothing but a fungus and an alga in a symbiotic relation. Bonnier has not only succeeded in obtaining by artificial culture in a sterilized atmosphere a well-developed thallus in several species of corticolous and saxicolous lichens, but lately has carried these artificial lichens

¹Ber. Deutsch. Bot. Gesell., iv (1886), pp. 277-83.

to fructification in several cases. The most successful experiments were conducted at high altitudes in the Alps and Pyrenees. Heretofore one of the chief objections to the cultures of Bonnet, Stahl and others has been that they used gonidia and fungus hyphæ. But in the successful experiments of Bonnier the alga used was a *Protococcus* or *Pleurococcus*, while those in which gonidia were used under the same conditions failed.

MR. R. A. ROLFE, in *Gardener's Chronicle* (June 11), describes a bigeneric hybrid between *Colax* (*Lycaste*) *jugosus* as male and *Zygopetalum crinitum* as female. He gives it a new generic name, compounding the two parent names and calling it *Zygocolax*. He does not pretend to rank it with natural genera, but considers these hybrids as artificial productions and to be treated accordingly. It is questionable whether they should be dignified with new generic names of any kind, as botanists have not yet grown out of the notion that crossing genera should not be considered distinct. It is still an open question how far the skillful manipulation of cultivators should affect the definition of natural genera. The same writer, in a paper before the Linnean Society on "Bigeneric Orchid Hybrids," presents the following conclusions with regard to orchid hybrids: (1) Hybridization may take place, not only between distinct species, but also between distinct genera, or between plants so structurally different as to be usually regarded as such; (2) these hybrids are generally of artificial origin, or accidentally produced, and can not be treated in the scheme of classification either as varieties, species or genera; (3) the possibility of hybridization taking place between species hitherto considered as distinct does not necessarily prove them to be merely forms of the same species; (4) the occurrence of a hybrid between two structurally different genera does not prove the necessity of uniting them in one, nor can such hybrids be arbitrarily referred to either of the parent genera; (5) species and genera will always have to be dealt with in the scheme of classification according to their structural peculiarities and differences, without reference to the possibility of hybridization taking place between them.

THE TARDY development of the ovules of the *Orchidaceæ* has long been known. Recent studies of Guignard¹ among plants of this order add to the number and throw much additional light on the subject. So slow is the development of the ovules that in some cases six months elapses between pollination and fecundation. Orchids of temperate climates, however, are quicker, the time varying from one to four weeks. Is this because they are more likely to be exposed to untoward influences than those of the equable tropics? The orchids are not alone, however, in this respect. Maury² has recently found that several species of *Verbascum* have rudimentary ovules at the time of pollination, and other plants are already known. Probably when the subject has been further investigated the list will be greatly increased. It would appear from Van Tieghem's and Guignard's researches that the development of the ovule is a sort of hypertrophy resulting from the formation of an excess of nourishment. It is well known that the pollen tubes live in the tissues of the pistil in a parasitic fashion, and if they develop in their growth a ferment, as certain fungus parasites do, there is no reason why hypertrophy should not be the result in the one case as it so commonly is in the other. Here is an interesting field for some American botanist to work, respecting our native plants.

¹ Ann. Sci. Nat. (Bot.), iv, 202.

² Bull. Soc. Bot. France, viii, 529. Fide J. R. M. S.

DR. ASA GRAY has been triply honored abroad this year during the season of degrees. Not that any titles could add to the wealth of his fame, but they are very pleasant acknowledgements of his great services to the science of botany. The degrees come from Cambridge, Oxford and Edinburgh. The D. C. L. of Oxford was accompanied by the following summary of his personal characteristics: *Moribus suavissimis veritatisque semper quam famæ propriæ studiosior*. The LL. D. of Cambridge came with the epithet *Floræ sacerdos venerabilis*, and the following address by Dr. Sandys (we clip a translation from the *Independent*): "And now we are glad to come to the Harvard Professor of Natural History, *facile princeps* of transatlantic botanists. Within the period of fifty years how many books has he written about his fairest science, how rich in learning, how admirable in style! How many times has he crossed the ocean that he might more carefully study European herbaria, and better know the leading men in his own department! In examining, reviewing, and sometimes gracefully correcting, the labors of others, what a shrewd, honest and urbane critic has he proved himself to be! How cheerfully, many years ago, among his own western countrymen, was he the first of all to greet the rising sun of our own great Darwin, believing his theory of the origin of various forms of life demanded some First Cause, and was in harmony with a faith in a Deity who has created and governs all things! God grant that it may be allowed to such a man at length to carry to a happy completion that great work which he long ago began, of more accurately describing the flora of North America. Meanwhile, this man who has so long adorned his fair science by his labors and his life, even unto a hoary age, 'bearing,' as our poet says, 'the white blossom of a blameless life,' him, I say, we gladly crown, at least with these flowerets of praise, with this corolla of honor [*his saltem laudis flosculis, hac saltem honoris corolla, libenter coronamus*]. For many, many years may Asa Gray, the venerable priest of Flora, render more illustrious this academic crown!" To no one has the degree ever come more worthily. May the prayer for added years be answered! It finds an echo in every American botanist's heart.